

Correspondence

The Editorial Board will be pleased to receive and consider for publication correspondence containing information of interest to physicians or commenting on issues of the day. Letters ordinarily should not exceed 600 words, and must be typewritten, double-spaced and submitted in duplicate (the original typescript and one copy). Authors will be given an opportunity to review any substantial editing or abridgment before publication.

Facts on Ballistics

TO THE EDITOR: I have just completed reading in the August issue the Trauma Rounds article discussed by Dr. James M. Wilson, "Shotgun Ballistics and Shotgun Injuries." There are several unfortunate errors in the article concerning the technical information provided on shotgun loadings. Among the more obvious is the comment that shotgun powders are dangerous when used in handgun cartridge loadings. Many shotgun powders are very useful for handgun loads. Additionally, the weights of shotgun and pistol projectiles mentioned in the article are inaccurate as stated in grams; I believe the author meant grains. A .357 magnum revolver usually fires a 125 to 158 grain projectile rather than one weighing 90 grams. Certainly a shotgun firing a 295 gram projectile would be fearsome as this is almost three quarters of a pound of lead.

SPENCER L. KULICK, MD
San Luis Obispo, California

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TO THE EDITOR: The article by Wilson on shotgun wounds was most informative, but it contained a few minor errors. Kinetic energy of a moving object is, of course, given by $\frac{1}{2} MV^2$; there is no "g" in the formula. Dr. Wilson correctly states that the diameter of a pellet of 00 buckshot is $\frac{1}{3}$ inch, but then goes on to translate this to .22 caliber, rather than the correct .33 caliber. The correct weight of a 12-gauge slug is $\frac{7}{8}$ ounce or about 25 grams (not 295 grams) and that of a .357 magnum (or .38 special) bullet is 158 grains or about 10.2 grams (not 90 grams). The standard load of buckshot contains 9 of these .33 caliber pellets, as noted, but police and others frequently use magnum loads containing 12 or (in 3-inch magnum) 15 such pellets. Of additional interest is the fact that either a 12-gauge slug or 00 buckshot can penetrate at least two plaster-and-wood walls, or a car door, further emphasizing the lethal nature of this weapon and the danger of using it inside buildings or in heavily populated areas.

JOHN J. MORGAN, MD
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Dr. Wilson Responds

TO THE EDITOR: I wish to thank Drs. Kulick and Morgan for their comments concerning the article on shotgun injuries. They have both pointed out a confusing typographical error in that, as they have noted, the word *grams* should read *grains*.

Dr. Kulick's comment that shotgun powders are used in handgun loadings is true; however, the statement made in the text was in regard to the use by novices in home loading. For example, if, by mistake, equivalent weights of shotgun powders are used in pistol cartridges, excessive pressures will be generated. Thus, a great deal of care must be exercised in using these faster burning powders in pistol or rifle cartridges. Also, Dr. Kulick's correction of 90 grams to 90 grains is correct. However, the range weights of projectiles for a .357 magnum is incorrect. Indeed, a 90-grain bullet for the .357 magnum is commercially available (Smith and Wesson).

Dr. Morgan states that there is no "g" in the kinetic energy equation; indeed, the acceleration of gravity "g" appears in this and several other equations dealing with higher order ballistics. If one wishes to express the kinetic energy in foot-pounds (which is the unit used in all standard ballistics tables), the result ($\frac{1}{2} MV^2$) in poundals must be divided by the acceleration of gravity (32.2) to obtain footpounds. This conversion is amply explained by DeMuth (*Journal of Trauma* 9:27-38, 1969) and can be found in any standard textbook on ballistics.

The comparison of buckshot to the .22 bullet by approximate overall size is correct. The article does not translate this to mean caliber. If one considers the fact that the weights and velocities (at certain ranges) are approximately the same for buckshot and the .22 bullet, then the kinetic energy on impact is approximately the same—which, after all, is the most important factor with respect to wounding potential (DeMuth, *Journal of Trauma* 11:219-229, 1971). A comparison based solely on caliber would not be appropriate, since a .33 caliber bullet and buckshot would